


## Technical Fact Sheet: Final Rule for Arsenic in Drinking Water

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- Arsenic in drinking water rule (66 FR 6976 / January 22, 2001)  
([read online](#)) ~ ([PDF file](#))
-  **NEW** [EPA is reviewing the new arsenic in drinking water standard](#). EPA will work with the National Academy of Sciences and the National Drinking Water Advisory Council to reassess the scientific and cost issues associated with the rule.

### 1. What are we announcing?

Today's final rule revises the current Maximum Contaminant Level (MCL) from 50 µg/L to 10 µg/L and sets a Maximum Contaminant Level Goal (MCLG) of zero for arsenic in drinking water. In addition, this final rule also clarifies how compliance is demonstrated for many inorganic and organic contaminants in drinking water.

### 2. What are the requirements of this final rule?

Both community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs) will be required to reduce the arsenic concentration in their drinking water systems to 10 µg/L. A CWS is a public water system that serves at least 15 locations or 25 residents regularly year round (e.g., most cities and towns, apartments, and mobile home parks with their own water supplies). An NTNCWS is a public water system that is not a CWS and serves at least 25 of the same people more than 6 months of the year (e.g., schools, churches, nursing homes, and factories).

This final rule is also a vehicle for clarifying two compliance requirements for inorganic contaminants (IOCs), volatile organic contaminants (VOCs), and synthetic organic contaminants (SOCs). When a system fails to collect the required number of samples, compliance averages will be based on the actual

number of samples collected. Also, new public water systems and systems using new sources of water must demonstrate compliance within State-specified time and sampling frequencies.

### **3. How soon after publishing the final rule will the changes take effect?**

All CWSs and all NTNCWSs that exceed the MCL of 10 µg/L will be required to come into compliance 5 years after the publication of the final rule. Beginning with reports that are due by July 1, 2002, all CWSs will begin providing health information and arsenic concentrations in their annual consumer confidence report (CCR) for water that exceeds ½ the new MCL.

### **4. Why is this rule significant?**

In the 1996 amendments to the Safe Drinking Water Act (SDWA), Congress directed EPA to propose a new arsenic regulation by January 1, 2000 and to issue the final rule by January 1, 2001 (Congress subsequently extended the final rule date to June 22, 2001). EPA published the proposed rule for arsenic on June 22, 2000. The rule proposed an MCL of 5 µg/L for arsenic and EPA took comment on regulatory options of 3 µg/L (the feasible level), 10 µg/L and 20 µg/L. The 1996 amendments to SDWA added discretionary authority for the EPA Administrator to adjust the maximum contaminant level (MCL) if the benefits would not justify the costs (§1412(b)(6)). Today's rule is important because it is the second drinking water regulation in which EPA will use the discretionary authority under §1412(b)(6) of SWDA. After careful consideration of the benefits and the costs, EPA has decided to set the drinking water standard for arsenic higher than the technically feasible level of 3 µg/L because EPA believes that the costs would not justify the benefits at this level. EPA believes that the final MCL of 10 µg/L maximizes health risk reduction at a cost justified by the benefits.

### **5. What health effects are associated with exposure to arsenic from drinking water?**

In most drinking water sources, the inorganic form of arsenic tends to be more predominant than organic forms. Inorganic arsenic in drinking water can exert toxic effects after acute (short-term) or chronic (long-term) exposure. Although

acute exposures to high doses of inorganic arsenic can cause adverse effects, such exposures do not occur from public water systems in the U.S. that are in compliance with the existing MCL of 50 µg/L. Today's final rule addresses the long-term, chronic effects of exposure to low concentrations of inorganic arsenic in drinking water. Studies link inorganic arsenic ingestion to a number of health effects. These health effects include:

- *Cancerous Effects:* skin, bladder, lung, kidney, nasal passages, liver and prostate cancer; and
- *Non-cancerous effects:* cardiovascular, pulmonary, immunological, neurological and endocrine (e.g., diabetes) effects.

## **6. What are the sources of arsenic contamination in water?**

The contamination of a drinking water source by arsenic can result from either natural or human activities. Arsenic is an element that occurs naturally in rocks and soil, water, air, plants, and animals. Volcanic activity, the erosion of rocks and minerals, and forest fires are natural sources that can release arsenic into the environment. Although about 90 percent of the arsenic used by industry in the United States is currently used for wood preservative purposes, arsenic is also used in paints, drugs, dyes, soaps, metals and semi-conductors. Agricultural applications, mining, and smelting also contribute to arsenic releases.

## **7. How many people and how many systems will be affected by this rule?**

Higher levels of arsenic tend to be found more in ground water sources than in surface water sources (*i.e.*, lakes and rivers) of drinking water. Compared to the rest of the United States, the Western states have more systems with arsenic levels greater than 10 µg/L. Parts of the Midwest and New England have some systems whose current arsenic levels are greater than 10 µg/L, but more systems with arsenic levels that range from 2-10 µg/L of arsenic. While many systems may not have detected arsenic in their drinking water above 10 µg/L, there may be geographic "hot spots" with systems that may have higher levels of arsenic than the predicted occurrence for that area. About 3,000 (or 5.5 percent) of the nation's 54,000 CWSs and 1,100 (or 5.5 percent) of the 20,000 NTNCWSs

will need to take measures to lower arsenic in their drinking water. Of the affected systems, 97 percent serve less than 10,000 people. Table 1 below shows the estimated number of CWSs and NTNCWSs that would be affected by this rule and the estimated population served by these public water systems.

<b>Table 1. Estimates of the Number of CWSs and NTNCWSs That Would Need to Treat and the Population Served by These Systems</b>			
<b>Regulatory Action</b>	<b>Type of System and Total Number</b>	<b>Number Systems Affected</b>	<b>Total Population Served by the Affected Systems</b>
10 µg/L	CWSs (54,000)	~ 3,000	~ 11 million
10 µg/L	NTNCWSs (20,000)	~ 1,100	~ 1.7 million

#### 8. How much will this rule cost?

EPA estimates the total national annualized costs of treatment, monitoring, reporting, recordkeeping, and administration for this rule to be approximately \$181 million (using 1999 dollars at a three percent discount rate - Table 2). Most of the cost is due to the cost of installing and operating the treatment technologies needed to reduce arsenic in public water systems (both CWSs and NTNCWS). EPA estimates the total treatment cost to be approximately \$177 million per year. Annual monitoring and administrative costs will be about \$2.7 million and States' costs will be approximately \$1 million.

<b>Table 2. Annual National System and State Compliance Costs (3% Discount Rate, \$millions)</b>			
	<b>CWS</b>	<b>NTNCWS</b>	<b>Total</b>
System Costs			
Treatment	\$170	\$7.0	\$177
Monitoring/Administrative	\$1.8	\$0.9	\$2.7
State Costs	\$0.9	\$0.1	\$1.0
<b>Total Cost</b>	<b>\$173</b>	<b>\$8</b>	<b>\$181</b>

The average annual household costs for the homes served by the approximately 2,387 CWSs that require treatment are expected to be approximately \$32 per year. The average annual household costs are shown categorized by system size in Table 3. The disparity in household costs between systems sizes is due to economies of scale. Larger systems are able to spread the costs they incur over a larger customer base.

**Table 3. Total Annual Costs (Dollars) per Household for CWSs**

<b>System Size</b>	<b>25-500</b>	<b>501-3,300</b>	<b>3.3K-10K</b>	<b>10K-and above</b>
<b>Annual Household Costs</b>	\$ 327-\$162	\$ 71-\$58	\$ 38	\$32-\$0.86

The estimated average annual costs for CWSs, which exceed the final MCL of 10 µg/L and are required to treat, are shown in Table 4 categorized by system size.

<b>Table 4: Average Annual Costs per CWS (Dollars)</b>	
<b>CWS System Size</b>	<b>Costs ( \$ )</b>
25-500	\$6,494-\$12,358
501-3,300	\$22,100-\$53,086
3,300-10,000	\$111, 646
10,000 and above	\$531,584-\$1,340,716

## 9. What are the benefits of this rule?

The rule will protect approximately 13 million Americans served by CWSs and NTNCWSs (this number is based on reducing arsenic from 50 to 10 µg/L) .

Reducing arsenic from 50 to 10 µg/L will prevent ~ 19-31 cases of bladder cancer and ~ 5-8 deaths due to bladder cancer per year. EPA estimates that reducing arsenic from 50 to 10 µg/L will prevent ~ 19-25 cases of lung cancer and ~ 16-22 deaths due to lung cancer per year. In addition to these quantified benefits, there are substantial non-quantified benefits of this rule, including reducing the incidences of non-cancerous effects summarized above.

The quantified annual benefits for the today's rule range from \$140 to \$198 million. The benefit range consists of both lower and upper bound estimates.

These estimates reflect the upper and lower bound of the risk range addressed by this rule as well as different drinking water consumption distributions that were used in our analysis.

## 10. Is there funding associated with this rule?

Since 1996, the Drinking Water State Revolving Loan Fund (DWSRF) has made over \$3.2 billion available for loans to help water systems improve their infrastructure. EPA also provides funding to States that have primary enforcement responsibility for their drinking water programs through the Public Water Systems Supervision (PWSS) grants program. Other federal funds are available through Housing and Urban Development's Community Development

Block Grant Program, and the Rural Utilities Service of the U.S. Department of Agriculture. In the most recent year, 2000, the DWSRF and Rural Utilities Service combined made \$1.7 billion available to States and public water systems for capital improvements and infrastructure needs.

#### **11. How did EPA consult with stakeholders?**

From 1997-1999, EPA conducted a number of Agency workgroup meetings on arsenic as well as five stakeholder meetings across the country. Representatives of eight Federal agencies, 19 state offices, 16 associations, 13 corporations, 14 consulting engineering companies, two environmental organizations, three members of the press, 37 public utilities and cities, four universities, and one Indian tribe attended the stakeholder meetings on arsenic. Five States also provided written comments on implementation issues during the rule development process. The Office of Water staff presented an overview of the arsenic rulemaking to over 900 Tribal attendees in 1998 and provided more detailed information in 1999 to 25 Tribal council members and water utility operators from 12 Indian tribes.

As part of the Small Business Regulatory and Enforcement Flexibility Act (SBREFA) consultation process, EPA also received substantial input from discussions with small entity representatives. The National Drinking Water Advisory Council (NDWAC) provided useful input, particularly on the benefits analysis and small systems affordability. We also posted discussion papers produced for our stakeholder interactions on the Office of Ground Water and Drinking Water (OGWDW) Internet site and sent them directly to participants at stakeholder meetings and others who expressed interest. In addition, EPA provided updates on our rulemaking activities at national and regional meetings of various groups and trade associations. Furthermore, we participated in technical workgroup meetings held by the American Water Works Association (AWWA). EPA received comments from over 1,100 commenters from the public on the proposed rule. EPA has considered these comments carefully in developing today's final rule for arsenic.

## 12. Where can the public get more information about this final rule?

For general information on arsenic in drinking water, contact the Safe Drinking Water Hotline, at (800) 426-4791, or visit the EPA Safewater website at

<http://www.epa.gov/safewater> or the arsenic website at <http://www.epa.gov/safewater/arsenic.html>.

In addition to this technical fact sheet, the following documents and fact sheets will be available to the public at EPA's web site on arsenic in drinking water:

1. *Federal Register* notice of the final arsenic regulation
2. Detailed technical support documents on Arsenic in Drinking Water
3. Consumer Fact Sheet on Arsenic in Drinking Water

A copy of the *Federal Register* notice of the final regulation or any of the technical and consumer facts sheets can be obtained by contacting the Safe Drinking Water Hotline at (800) 426-4791 and (703) 285-1093. The Safe Drinking Water Hotline is open Monday through Friday, excluding Federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Time.

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